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# United States Patent [19]

**Dodabalapur et al.**

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[54] **ARTICLE COMPRISING A THIN FILM TRANSISTOR WITH LOW CONDUCTIVITY ORGANIC LAYER**

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[52] **U.S. Cl.** ..... **257/40**; 257/289; 257/347; 257/410; 257/642

[58] **Field of Search** ..... 257/40, 289, 410, 257/347, 642

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[57] **ABSTRACT**

Organic thin film transistors having improved properties (e.g., on/off ratio>$10^5$ at 20° C.) are disclosed. The improved transistors comprise an organic active layer of low conductivity (<$5\times10^{-8}$ S/cm at 20° C., preferably less than $10^{-8}$ or even $10^{-9}$ S/cm). A method of producing such materials is disclosed. Rapid thermal annealing was found to have beneficial results. An exemplary and preferred material is α-hexathienylene (α-6T). The improved transistors are expected to find use for, e.g., active liquid crystal displays and for memories.

**7 Claims, 4 Drawing Sheets**